

Highly-Integrated, Reconfigurable, Large-Area, Flexible Radar Antenna Arrays, Phase I

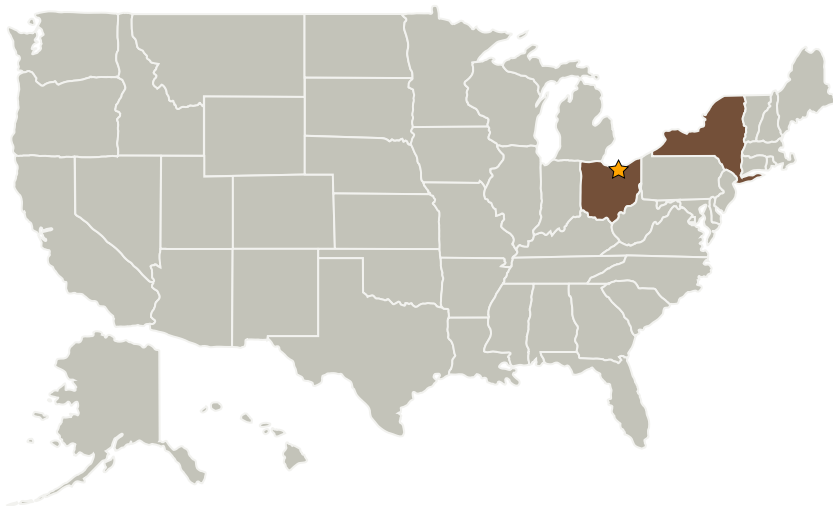
Completed Technology Project (2006 - 2007)



Project Introduction

Reconfigurable antennas are attractive for remote sensing, surveillance and communications, since they enable changes in operating frequency and / or radiation pattern, resulting in high-bandwidth antenna systems, with broad areas of coverage. Additional functionality would be achieved by integrating: control, processing, and communications directly onto the antenna substrate; MEMS sensors into the antenna substrate to monitor the system health; and opto-electronic beam forming networks, providing immunity to electromagnetic interference. In order to make such systems affordable for space exploration, it is critical to minimize the cost of transporting them into space. For this reason, antennas fabricated on flexible substrates are highly desirable since they can be rolled up and launched in a low-volume configuration, then inflated in space. While these advantages are significant, the fabrication of antennas providing these features is challenging due to the lack of manufacturing technologies that can meet all of the processing requirements for fabrication on flexible substrates. In this program we will develop antenna designs and lithography-based processes, enabling manufacturing processes that cannot be carried out using existing patterning technologies, in particular: laser-crystallization, allowing for the integration of ICs; and a combination of processes to produce MEMS for on-board sensors and for reconfiguring the array.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Anvik Corporation	Supporting Organization	Industry	Hawthorne, New York

Primary U.S. Work Locations	
New York	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Rao Tatavarti

Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.2 Radio Frequency
 - └ TX05.2.6 Innovative Antennas